

## CLAIMS

1. A system for assisting regeneration of a storage/release NO<sub>x</sub> trap integrated into an exhaust system (5) of a motor vehicle diesel engine (4), characterized in that it includes means (11) for injecting fuel into the cylinders of the engine (4) in the form of at least pilot and main injections and means (12) for controlling the injection means (11) to switch the engine (4) periodically from a standard mode of operation using a lean mixture with one pilot injection and one main injection, in which NO<sub>x</sub> are stored in the trap (6), to a regeneration mode of operation using a rich mixture, with at least two pilot or main injections depending on the engine load, in which NO<sub>x</sub> are released from the trap (6) and the trap is regenerated.
2. A system according to claim 1, characterized in that the control means (12) are adapted to control the injection means (11) in the standard and regeneration modes of operation with two pilot injections or two main injections for engine loads less than or greater than a predetermined threshold value, respectively.
3. A system according to claim 2, characterized in that the predetermined load threshold value is defined by a brake mean effective pressure (BMEP) of approximately 3 bar.
4. A system according to any preceding claim, characterized in that, for the engine (4) being associated with means (9) for recirculating exhaust gas to its inlet side, the control means are adapted to regulate the operation of the recirculation means (9) when the engine is using a rich mixture.
5. A system according to any preceding claim, characterized in that, in the mode of operation with two

pilot injections, the two pilot injections (1, 2) are triggered in a range from approximately 50° (crankshaft) to approximately 5° (crankshaft) ahead of top dead centre for the cylinder concerned and the main injection (3) is  
5 triggered in an undercalibrated range up to approximately 35° (crankshaft) after top dead centre.

6. A system according to any one of claims 2 to 4, characterized in that, in the mode of operation with two  
10 main injections, the pilot injection (1a) is triggered for a range from approximately 50° (crankshaft) to approximately 5° (crankshaft) ahead of top dead centre for the cylinder concerned and the main injections (2a, 3a) are triggered in an undercalibrated range from  
15 approximately 20° (crankshaft) ahead of top dead centre to approximately 120° (crankshaft) after top dead centre.

7. A system according to any preceding claim, characterized in that the control means (12) are adapted  
20 to control the injection means (11) in order to operate the engine with a lean mixture for approximately 60 seconds and with a rich mixture for approximately 2 seconds.

25 8. A system according to any preceding claim, characterized in that the engine is associated with gas inlet means for admitting gas thereto and the control means (12) are adapted to reduce the quantity of gas admitted into the engine (4) when the latter is operating  
30 in its regeneration mode.